

United States Patent [19]

Adolph et al.

[11] Patent Number: **4,988,397**[45] Date of Patent: **Jan. 29, 1991****[54] ENERGETIC BINDERS FOR PLASTIC BONDED EXPLOSIVES**

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[51] Int. Cl.³ **C06B 45/10**

[52] U.S. Cl. **149/19.3; 149/19.4; 149/19.6; 149/88; 149/92**

[58] Field of Search **149/19.3, 19.4, 19.6, 149/20, 88, 92**

[56] References Cited**U.S. PATENT DOCUMENTS**

3,873,626 3/1975 Adolph 149/88 X
4,141,768 2/1979 Lo et al. 149/19.6 X
4,555,277 11/1985 Scribner 149/19.4

OTHER PUBLICATIONS

Chem. Abst., 72: 99391, by Johncock.
Johncock, Chem. Abst., vol. 78, #30524.

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[57] ABSTRACT

An energetic uncured binder composite mixture comprising

(1) a hydroxy-terminated polyfluoroformal prepolymer of the general formula



wherein n is 3 or 4 and m is selected to provide a number average molecular weight of from about 1,000 to about 10,000 for the prepolymer; and

(2) an energetic plasticizer which is bis(2,2-dinitropropyl)formal, bis(2,2-trinitroethyl)formal, bis(2-fluoro-2,2-dinitroethyl)formal, bis(2,2-difluoro-2-nitroethyl)formal, 2,2-dinitropropyl 2-fluoro-2,2-dinitroethyl formal, or mixtures thereof;

wherein the weight ratio of energetic plasticizer to prepolymer is from about 2:1 to about 5:1. This binder composite mixture is useful for preparing energetic plastic bonded explosives having high chemical and thermal stabilities.

10 Claims, No Drawings